CLAIMS

1) A method for forming a module providing real-time simulation of a flow mode, at any point of a pipe, of a multiphase fluid stream comprising at least a liquid phase and at least a gas phase, for fixed operating conditions concerning a determined structure parameters relative to the pipe, and a set of determined physical quantities, with fixed variation ranges for the parameters and the physical quantities, by a modelling system based on non-linear neural networks each having inputs for the structure parameters and the physical quantities, outputs where quantities necessary for estimation of the flow mode are available, and at least one intermediate layer, comprising determining the neural network so as to adjust to values of a learning base with predetermined tables connecting values obtained for output data from the output to corresponding values of input data to the inputs and wherein the learning base imposes operating conditions and the determined neural networks are adjusted to the imposed operating conditions.

2) A method as claimed in claim 1, wherein the physical quantities are hydrodynamic quantities.

3) A method as claimed in claim 1, wherein the physical quantities are thermodynamic quantities.

4) A method as claimed in claim 2, wherein the module being integrated is a hydrodynamic and thermodynamic multiphase flow simulation model, the model being used to form the learning base to select the physical quantities best

suited to the model, variation ranges fixed for the parameters and the physical quantities, and an optimized neural networks best suited to the learning base.